

The Medical World of Frederick the Great

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THE TURN of the seventeenth century marked the beginning of an era that saw a hitherto insignificant Prussia win a seat in the concert of the great powers in Europe. Two monarchs of extraordinary stature, the Hohenzollern kings, Frederick William I and his son and successor, Frederick II, accomplished this feat; and for better or worse, the continent, in fact the world, had to reckon with this event in the centuries to come until our very own day.

To use present-day parlance, both sovereigns in their adolescent years had been "anti-establishment" and found themselves in a deep "generation gap" with the way their elders were conducting the business of royal ruling. Frederick William I was a man of incorruptible righteousness and of a practical Christian piety. He was, in modern terms, the "square" incarnate. Appalled at the waste and extravagance in the regime of his father, King Frederick I, and dismayed by malfeasance and overt defalcation of his father's ministers and public servants, from the day he was crown prince, Frederick William had resolved to change it all. And change it he did. On his ascent to the throne in 1713 the watchwords in Prussia became husbandry and soldiery, thrift and service. The country's military and financial weaknesses his father had left him were transformed by Frederick William's passionate devotion to the army and his unrelenting dedication to the ex-

igencies of civil administration into the characteristic features of the Prussian state: efficiency, organization and discipline. Frederick William I, generally known as the "soldier-king," was actually Prussia's greatest ruler in home affairs.

Nor did King Frederick William allow for deviations in the rigorous demands of the monarchy. It was here that Crown Prince Frederick, his son and heir, came to grief. Contrary to his father's wishes for a strict military and sober Protestant upbringing, he showed preponderant intellectual leanings, a love for music and literature, and adopted freethinking philosophy. Political aspects finally entered the tension between father and son and came to a head when in 1730 the crown prince made an abortive attempt to flee the country. The king reacted with utmost severity to what he considered desertion from the army. He stripped his son of his military rank, had him imprisoned and made him watch from the window of his cell the execution of his friend, Lieutenant von Katte, a co-conspirator in the escape plot.

If ever educational "shock treatment" succeeded, it was in the case of Crown Prince Frederick. He submitted to his father and completely changed his attitude toward the claims of his prospective royal duties, served in lowly positions in a provincial administration and, in 1733, married for political expedience an unloved Princess of Brunswick-Bevern. This unhappy bond with a goodhearted but unattractive and intellectually barren partner remained childless.

When Frederick II succeeded to his father's crown in 1740, he looked back upon seven delightful and rewarding years in his retreat at the castle

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of Rheinsberg, where he had devoted himself to extensive reading and systematic studies in French literature. In correspondence with Voltaire he had acquired a complete mastery of French, which became a natural means of expression to him. His rare attempts at his native tongue resulted in paragons of ungrammatical German, of which the hand-written letters to his valet, Fredersdorff, furnish touching proof.¹

The ideal of government became for Frederick an "enlightened" but "absolute" monarchy serving the welfare of the people under the ruler's sense of responsibility. He immediately put his enlightened and humane principles into practice. Exiled scholars were recalled, torture was abolished and penalties for crime were mitigated. Lavish patronage was extended to music and the arts, and an opera house was built in Berlin. This *roi philosophe* held court among persons with outstanding minds from all over Europe; but it soon became clear that he was also a statesman and soldier and in no way planned to inaugurate an easy-going regime.

Within less than eight months after his accession to the throne, he opened *Blitzkrieg* against Maria Theresa of Austria and secured by a lightning campaign what at best were doubtful dynastic claims on Silesia. It was a purely aggressive war; and so was its continuation a year later, when some of Frederick's most notable victories in the field finally gained the coveted territory. Yet for several more years the fighting went on with changing fortunes of war until, in 1745, Frederick prevailed and hereafter attained his subjects' designation of "the Great."

In the subsequent decade of peace, 1746-1756, a matured king devoted all his energies to the service of the state, which became the religion of this mocking skeptic. On the foundation of his father's administrative organization, the famed *rocher de bronze*, progress was made everywhere, commerce and industry thrived, the population grew and every family had its "chicken in the pot on Sunday." In his rococo palace the royal "philosopher of Sans Souci" found his only relaxation in learning, in literature, in flute-playing and in collecting art. Around him was gathered a circle of literary friends; and Frederick's own literary work reached its height in his *Histoire de mon Temps*, vastly superior in style, clarity and political judgment to most other contemporary academic writings.

As he was certain that Maria Theresa would never be reconciled to the loss of Silesia, Frederick stayed prepared for war continuously. When this Seven Years' War came in 1756, Prussia was able to survive politically intact by her king's unbending will and his stoical indifference to adversities. Yet the country was left in utter ruin. Its reconstruction, Frederick's greatest peacetime achievement, equals his military performance in the Seven Years War. When "Der Alte Fritz" ("Old Fred") died in 1786, he left a prosperous land with expanded territory and rich new provinces, with many reforms and projects of great promise. He had made Prussia a model state of "enlightened despotism" admired by her contemporaries. But the system was already outmoded at the time of his death because only the "omnipresent" king knew how to control it. To admit this does not diminish the significance of this monarch's creative achievement or of his personality as a statesman. The intensity and the self-discipline with which he strove for harmonious solutions of his political problems assured him of true and lasting historical greatness.

A Facet for All Historians

It is no longer only the conventional historian who can unfold the full many-sidedness of Frederick the Great's extraordinary personality. The facets that sparkle in the life and achievements of Prussia's greatest king cast light on a multitude of aspects and yield important material for a variety of specialist studies in the history of politics, of military history, of sociology, philosophy, literature and even of medicine. Probing in the last-named field, I arrived at startling realizations of general interest which prompted me to prepare this paper on the relations of Frederick the Great to the medical world of his times, both with regard to his personal medical history and to his influence on the healing arts in general.

Frederick himself had more than his full share of health failings and sickness, probably more than the majority of his fellow humans. Among the causes may have been the enormous physical and mental strain his royal calling imposed upon him. We possess contemporary accounts by two of his personal physicians, Drs. Selle and Zimmermann.

Dr. Selle, in his "Case history of his majesty the King of Prussia, Frederick the Second,"² describes

the monarch's terminal days of suffering with only a few remarks about his earlier state of health. The essay is addressed to the medical profession, a matter-of-fact, objective and totally unsensational postmortem of little interest to the nonmedical reader. The fact that Selle's account never attempted to relate the king's personality with his illness may be why Selle's report has never become widely known.

In contrast, the writings of Dr. Johann Georg Zimmerman found extensive dissemination among contemporary readers. His book, published in 1788, is entitled *Über Friedrich den Grossen und meine Unterhaltungen mit Ihm kurz vor seinem Tode* (*On Frederick the Great and my conversations with him shortly before his death*).³ Zimmermann had been called to the bedside of the ailing king as a consultant of international renown. He was a student of the famous Albrecht von Haller, whom Frederick profoundly admired. As in most of his literary and medical works, Zimmermann had no intention of producing a treatise for his colleagues; he wrote for the reading public at large, who wanted sensation and human interest in their stories.⁴ In such writing he transgressed beyond strictly medical aspects and often disregarded professional discretion—by recounting, for instance, that Frederick as crown prince had contracted venereal disease on a visit to his paramour Orzelska in Dresden, a statement which actually has remained unverified. As a result Zimmermann incurred severe criticism, in his own time and later, and became a rather unpopular figure. In many respects he may be compared in our day with Lord Moran, who published the case history of another illustrious patient, Winston Churchill, who had been in his medical care. There are, however, exceptions in the large chorus of critical opinions about Zimmermann, and one was expressed by none less than Goethe in his fifteenth volume of *Dichtung und Wahrheit*, where he stated that vanity as such was never offensive to him.⁵ Goethe was favorably impressed by Zimmermann's elegant and worldly deportment and wrote on several occasions about this strangely arrogant physician. Equally impressed, by the way, was Goethe by Zimmermann's most venerable patient, Frederick the Great; after reading his works, he said on October 25, 1788: "*Es ist doch etwas einziges um diesen Menschen*" ("There is truly something unique about this man").⁶

There was no lack of competent physicians in eighteenth-century Europe. Many practitioners had studied with outstanding teachers at home or abroad. Besides Albrecht von Haller, who taught at the newly founded university in Göttingen, and at others, the most renowned of that period was the Dutch internist Herman Boerhaave (1688-1738) at the University of Leyden. He was the first to introduce clinical instruction at the patient's bedside and to establish a teaching hospital, where he took his students on medical rounds to observe the daily changes in the patient's condition. His literary legacy unfortunately never approached what he had done for his patients and students, who flocked to him from all over the world. Haller, his most prominent pupil, called him "the General Teacher of all Europe," and his fame had also reached Frederick the Great, who kept constantly abreast of all intellectual and medical currents of his time. He ordered the doctors in his employ to sit down and study their "Boerhof" (sic), and he also probably knew that in 1745 his old adversary, Maria Theresa, had called a Boerhaave pupil, Gerard von Swieten, from Leyden to the famous Vienna School of Medicine with the task of placing public health service on a new and better footing.

If we examine the efficacy of medicine in the eighteenth century of Frederick's lifetime, we must bear in mind that by present standards the doctor's therapeutic armamentarium was exceedingly meager. Diagnosis was made by establishing the rate of the pulse and by gauging the body temperature (fever was judged by complexion of the skin and delirium, not by thermometer readings, for the clinical thermometer was not in general use until James Thompson established the absolute scale in thermometry in 1849). A further diagnostic criterion was urine examination. Few diseases were actually known: gout, intermittent fevers (malaria), smallpox, the plague, typhus, dysentery, influenza, venereal disease, hemorrhoids, stones, hernia. Treatment for the last two was operation (without anesthesia or antisepsis, which were not yet known). Venereal disease was treated with mercury ointment and vapors. For malaria there was cinchona bark, also known as Jesuit bark, now known as quinine (because of its effect in malaria cases, it was sometimes also used on all feverish diseases). Smallpox was ever-present and led to the first

attempts at inoculation. In gout the recommendation was a careful diet, abstention from "red meat, wine and high living," for gout was thought to be a disease of the well-born, well-to-do, and it was believed that turning to more frugal habits would be the cure. In the case of the plague, there was only prayer. Wounds, injuries and fractures were treated by surgeons and *Feldschers* (paramedics), who took charge and did the best they could in the circumstances.

Love and Disease

When Frederick II was born in 1712, it was reported to his grandfather, Frederick I, that the infant was fat and healthy. In his growing years the boy had resisted parental advice for physical exercise and was known to have avoided activities involving any physical discomfort. That this contributed to his later corpulence and severe constipation is more than likely. Frederick at the age of fifteen weighed almost one hundred thirty pounds, and early portraits show him as a heavy-set, ruddy-faced youngster. No doubt another contributing factor was his voracious appetite—an appetite he maintained even in later years when his health grew frail and when his physicians would demand a carefully restricted diet. His baby fat vanished after two attacks of what was reputed to be smallpox in 1718 and 1724, and some of his contemporaries described him even then as appearing "oldish and stiff," almost as if he had participated in some wars.

Subsequently there is constant mention of illnesses of Crown Prince Frederick. From time to time he did lose his appetite, became suddenly emaciated and looked like his own shadow. King Frederick William, his father, complained about this to his friend Prince Leopold of Anhalt-Dessau (the famed "Alte Dessauer" who played an equally important role in the lives and reigns of both father and son) and was "afraid of the worst"; in fact, he suspected *Auszehrung*, that is, consumption. Frederick's eldest sister, Wilhelmina, to whom he was always very close, did not share their father's concern for her brother's health. She attributed, perhaps rightly, this delicate appearance to Frederick's longing for a glamorous young woman, the Countess Orzelska, with whom he had fallen in love on a trip to Dresden. Indeed, shortly thereafter the crown prince began to ail with a variety of "nervous"

complaints, occasional feelings of suffocation, sleeplessness and palpitations of the heart, and at the same time he suffered from his most frequent misery, severe gastric colics. It would all add up to a model case of hysteria, or, as it was then called, hypochondriasis; but then it is not impossible that the ground had already been broken for the continuous gastrointestinal difficulties that afflicted Frederick all his life. Another peculiarity also seems to have developed at this time: Frederick's strong inclination to perspire violently. It finally went so far that all his night clothes and bed linens had to be dried before an open fire, summer and winter. As the dating of its first appearance is not totally reliable, this last symptom may also have been a manifestation of the malaria which Frederick contracted during his Rheinsberg days. It was there that he began to take china bark, now called quinine. Because this medicament suppressed his malarial fever, he developed the habit of taking it for any other fever condition that befell him.

Frederick was, in fact, habitually given to self-medication. He also prescribed for others near and dear to him. Inveterate scoffer and skeptic that he was, doctors by and large were quacks to him. The few exceptions included Boerhaave and Haller, whom he knew by their scientific reputations; also Cothenius, Selle and Zimmermann, whom he trusted as his personal physicians. All others he mockingly lumped together as charlatans who undertook to give him lessons, whereas he felt thoroughly schooled in the art of healing. So certain was he of his medical knowledge that he freely medicated and prescribed for his favorite sister, Wilhelmina, and his brother Ferdinand, both of whom lived in a state of chronic invalidism. He also supervised their physicians and had them report to him about the smallest details of their treatment. The same was the case with his erstwhile valet and subsequent councillor Fredersdorff, one of his most intimate and beloved confidants, who was, in Voltaire's words, *le grand factotum du roi Frédéric*. Only here, Frederick's habitual medication of others turned into something of an exchange, because Fredersdorff practiced alchemy and had concocted a number of the elixirs which Frederick took himself and dispensed among his chosen wards. The rare relationship of utter mutual trust between these two men is revealed in their extensive correspondence, which is largely

preserved and full of moving expressions of intense mutual concern for each other's health and well-being.¹

Gout and Hemorrhoids

Frederick's contempt for the "charlatans" finally went so far that he consulted physicians not on what medication to take, but only on how much to take. Yet as time went on, the king's suffering from gout increased markedly. As we learn from his Swiss reader and companion, von Catt, repeated exacerbation of hemorrhoids was another complaint, perhaps more a nuisance than an actual danger. The combination of previous illnesses, especially the frequent gastric colics, the severe chronic constipation, the king's usually sedentary way of life and his predilection for culinary excesses, would seem to form a logical background for the two principal ills which plagued Frederick to his dying day: gout and hemorrhoids. He also appears to have suffered from asthma, although it is impossible now to ascertain whether this so-called asthma was the allergic and emotionally conditioned disease that is now known under the name "bronchial asthma." Or were the repeated attacks of inability to breathe not in fact symptoms of congestive heart disease, angina pectoris or emphysema, none of which were then recognized as disease entities? At any rate, these attacks of asthma never lasted more than a few days and were generally amenable to the friendly assistance and harmless medications of his currently favored physician. All in all, the desperate degeneration of Frederick's health from the time he entered his thirties was quite in contrast to the healthy beginning of his life. It must still remain a major miracle how he was able, in his condition, to perform the tasks—at times superhuman—he had set for himself. He was not a well man.

Things of the Mind

So much for the somatic aspects of the medical history of Frederick the Great. Concerning the psychological side, it is small wonder that the mental and emotional functioning, or malfunctioning, of this exceptional personage became a choice subject for psychological investigation, both professional and amateur. Inasmuch as the best diagnostic methods—personal observation and interrogation—are no longer applicable, the

probing is of necessity confined to the interpretation of literary material. It therefore follows that any findings must remain speculative.

The most sweeping contemporary opinion was propounded in 1744 when, during a stay in Bad Pyrmont, a spa that Frederick used to visit for his health, the various royal physicians agreed that the king was suffering from "a choleric-melancholic temperament with a hypochondriacal affect on his body and soul." Von Catt, the king's reader, also speaks of observing frequent spells of melancholy, which occurred with aggravation of hemorrhoidal pain.⁷ There is, however, no indication that this depressive condition had ever taken threatening or debilitating forms. It seems to have been Frederick's natural reaction to mental or physical torment, of which he had quite a measure, and this reaction apparently remained ephemeral. Equally transient remained his not infrequent threats of suicide, of which the earliest fell in the time of his engagement and enforced marriage with an unloved and intellectually inferior bride. His feelings about the whole matter of his marriage he expressed, somewhat implacably, in the statement that he would have preferred a prostitute to a pious and unintelligent lady. At all times he clung to this life-long habit of voicing threats of suicide either orally or in letters to his friends; but even in the most desperate situations—and there were quite a few—he never seemed to have come close to carrying out such threats. He died of natural causes at the age of 74, unless we call habitual overeating a mode of slow suicide. On the subject of overeating, I wish to quote the all-knowing Dr. Zimmermann, who told of one occasion when he visited the king:⁸

At three in the afternoon I found the king in the most painful situation: every thing was changed and become worse. When in good humour, he had taken his [medicine of] dandelion and drank coffee: after this, he had applied, from half after three in the morning till seven, to public business. Great part of the morning he had spent in eating; for as soon as I left him, a plate of sweet-meats, composed of sugar, whites of eggs, and cream, had been brought him, one of which I ate, and found the cream very sour. His majesty ate the whole plateful for his breakfast; and afterwards strawberries, cherries, and cold meat. At eleven his servants found great difficulty in getting him on horseback. He remained there three hours, in the

great garden of *Sans Souci*, galloped almost the whole time, and returned very much weakened and exhausted. When he sat down to table he had no appetite; and immediately after dinner he was seized with a vomiting.

[On the next day] the king was much better than he had been the day before, after dinner; he however complained of a constriction and heaviness at his stomach. I advised him to take a dose of his digestive powder, which was his favourite remedy.

At three the king was again attacked by a colic, the consequence of indigestion; and he was in very bad humour. At dinner he had eaten plentifully of fresh eels, and yet he ascribed his colic to dandelion. He railed therefore against *Mr. Physician* and the dandelion.

For several days successively the king had taken some of his dear digestive powder; and afterwards rhubarb, and glauher salts, which I thought much more proper. Yesterday evening several strong stools had dispelled for a moment all his bad humour. "A new remedy," says his majesty, "has just arrived, which I mean to try at noon; this remedy," added he, "is fresh herrings." I congratulated his majesty on his new remedy, and begged him not to forget rhubarb and glauher salts, after which I was dismissed at the usual hour. After dinner, the king was not so well as he had been in the morning; but he behaved with much politeness.

Of Bed and Battlefield

A select field for speculative historical analysis is the investigation into the question of Frederick's standing in sexual matters. Of factual information we have his own statements: in 1771 when he recalled a favorite, but unnamed, paramour and said, "I remember with pleasure the wonderful moments which I spent in the arms of a young girl. She was not insatiable, but said with a certain degree of gentleness: 'My dear little hero, if you make yourself sick you won't be able to carry on war.'"⁹ It is not known to which of his two girl friends this episode refers—whether it was to a certain Formera, who was said to have been as "beautiful as the graces"; or to the Orzelska who was described by a contemporary, Pöllnitz, as a woman "of fine figure who had something grand in her air and carriage and the prettiest humor in the world." A further remark by Carlyle about this Orzelska, the second enamorata of Frederick the Great, is rather telling: "She often appeared in men's clothes, which became her very well.

People also said she was extremely openhanded." This last attribute differentiated her thoroughly from her royal friend, who was famous—or infamous—for his caution about spending money. The revenues from the state of Prussia were at times remarkably meager.

We also have witness from the indefatigable Dr. Zimmermann, who claims possession of reliable information that the crown prince had relations with a certain number of courtesans and on one such occasion contracted a venereal disease shortly before his marriage in 1732.¹⁰ This accident alone, but especially combined with Frederick's total indifference—possibly even aversion—toward the bride chosen for him by his father, could very well be the explanation for the childlessness of their marriage. Yet nobody will ever know for certain, because factual evidence has never come to light.

Nor was reliable proof ever offered for allegations that Frederick had homosexual leanings. There are speculations galore on this subject. They customarily fall back on references to the extensive writings of Liselotte, the witty and gossipy Princess-Consort of the Elector of the Palatinate.¹¹ For a lady of her rank and standing, she really possessed quite an amazing store of intelligence about contemporary sexual mores in the barracks and the camps in the field, to say nothing about her delving into the apparently rampant homosexuality at miscellaneous courts on the continent. The imputations of her sharp pen, which spared not even the highest and even pointed unforgivingly to personages like King Louis XV of France and the famed Austrian field-commander Prince Eugene of Savoy, and others with whom Frederick was well acquainted, would hardly stand up in any court of law as evidence of his homosexual involvement. Equally unsupported remain Voltaire's stigmatizing utterances on this theme, which came at a time when the king's lifelong friendship with the great philosopher had cooled. Without any apparent value, even as innuendo, this whole speculation may therefore be put *ad acta* as old wives' tales.

In a Word, Porphyria

In the light of present-day medical views, it would not seem too far-fetched to consider the variety of ailments that plagued Frederick the Great, not in their multiplicity, but simply as the

symptoms of one disease. This disease, diagnosis of which appears likely, is a metabolic nonsex-linked hereditary dysfunction, not very frequently found, called porphyria. Such a diagnosis would be supported by practically every manifestation in the total picture of the king's illness, all of which are known to be typical symptoms for this disorder. Particularly his chronic gastric colics and violent sweating, headaches and accelerated pulse, painful limbs and dark red urine (which, incidentally, accounts for the name of this disease), as well as ascites in his later years, and the weakness, occasional convulsions and depressive states that seized him from time to time. Another strong hint for the possible existence of porphyria would come from Frederick's genetic background. He was a descendant of the houses Hohenzollern and Hanover and a blood relation to George III of England, the "last king of America."¹² According to recent medico historical research, it is now assumed that George was a sufferer from porphyria,¹³ which is an inheritable disease and may have affected many members of these large families.

We have herewith arrived at the conclusion of the medical case history of King Frederick the Great. It now remains to take a look at this unusual monarch's attitude toward the medical questions of his day in general and his influence on them.

As Frederick II continued unchanged the strong military policy of King Frederick William I, he fully realized, like his father, that success on the battlefield would never be derived solely from the drill of the army and the tactics of his dreaded oblique line of battle. He was always aware of the signal importance of troop morale and its dependence on the concern of the leadership for the individual soldiers. Frederick made sure, therefore, that every last man received his pay and rations with the utmost punctuality, as the old marching song "Fridericus Rex" approvingly acknowledged. He also took care that the wounded and sick were not left to their fate. It appears, therefore, that it was Frederick the Great—not, as has long been assumed, Napoleon's Baron Larrey or the Americans in the Civil War—who conceived the idea of and introduced field hospitals and mobile (the so-called "flying") ambulances.¹⁴ All the minutest details for the military medical

system were worked out and supervised by the King himself, and he commissioned Dr. Fritze as superintendent of all army hospitals. Evidently Frederick had made a good choice, because Dr. Fritze, in 1780, very soon after his appointment, published a remarkably intelligent analysis of the Prussian army medical system.¹⁵ Nevertheless, it was actually the king who had to carry through his own reformation of the military health system, because Dr. Fritze died very shortly after completing his book.

The effective systematization of military medicine was difficult to carry out in the midst of war; hence Frederick had to postpone his reorganization until the wars had ended and actually devoted much of the final years of his government to the reforms of the military medical service. There were many problems that had to be settled. One was the hiring of a group of well-schooled physicians—"the young *Aesculapes*," as he called them—as suitable wartime staffs for the army hospitals and the troops. As for this appointment of physicians, the King decreed on December 30, 1780, that the medical faculty in Berlin was to maintain in peacetime a sufficient number of well-trained physicians for field and hospital duty. He ordered that doctors be selected "who had proved their mettle and who were better than those in the hospitals during the last war." And, furthermore, Frederick the Great, whose nature and government had always excelled in almost exasperating parsimony, instructed his much-admired personal physician, the Privy Councillor Cothenius, to figure the cost of a well-run field hospital, as well as a perfectly stocked field-pharmacy, both of which were to be planned with all perfection—and this time regardless of the expense it might involve. As was to be expected, with Frederick's careful planning the Prussian military medical service could serve as a model for all armies.

Public Health and Hygiene

But the King's concern for the organization of military medicine was vastly overshadowed by enormous problems relating to public health and hygiene in general. They required his constant intercession. Chief among these were the frequent outbreaks of contagious diseases, which ravaged not only the armies but the population as a whole. Plague, cholera, smallpox and typhus were the most frequent of these epidemics and

they usually took a dreadful toll. The eighteenth century was totally ignorant of any theoretical knowledge concerning the mode of contagion; nevertheless, intelligent use was made of quarantine whenever it seemed indicated. Frederick's attitude in these emergency situations was as remarkably enlightened as were most measures of his long reign. This is illustrated by one of his edicts in relation to quarantine intended to stem epidemics which clearly shows his awareness of the psychological side-effects. His order was never prematurely to disturb the flow of commerce, because rumors of epidemics often were nothing but false alarms sounded by the enemy so as to demoralize the troops and the people.

Beyond measures to prevent their spreading, Frederick actually attempted to disarm two of the most devastating diseases of his day, for which so far neither cure nor prevention had been discovered. These diseases were *Tollwut* (or rabies) and smallpox. No effective means of averting rabies existed before Pasteur's masterful discovery, although almost every imaginable nostrum was tried on the stricken. Rabies, or hydrophobia as it had been called in earlier times, ran unchecked through the human and animal population, just as it had since time immemorial and with a vastly higher frequency than in recent days, when the incidence has been kept low by the inoculation of dogs, which practically excludes from the chain of infection the once most frequent carrier. The other dreaded and fearsome disease was smallpox, which was rampant in the days of Frederick the Great and which he had contracted in his childhood. Smallpox, in fact, unlike other diseases which somehow seemed to respect the rich and the well born, was violently dangerous to all men from the common soldiers and workmen to the clergy, nobility and even the royal houses. There was scarcely a family in seventeenth and eighteenth century Europe which had escaped the loss of a child, or several children, to this disease, which, if it did not kill, left its victims cruelly disfigured by irreparable scars.

Smallpox Inoculation

The dread of smallpox was international, and it was the first disease that had ever given rise to attempts at preventive medicine. The earliest records on the prevention of smallpox come from China in the twelfth century, when *inoculation*

(to be sure, not vaccination) was practiced by applying ground and pulverized scab from the skin of victims of light cases of the disease. This pulverized matter was blown into the nostrils of the healthy child—or the infant was swaddled in a blanket over which smallpox dust had been scattered. In many of these and other variations of exposure to the disease, the inoculated patients would contract the infection, generally in a light form, and forever remain immune to reinfection. The Chinese method was adopted by other Asian peoples and became widespread to many parts of Africa and Asia Minor, where Lady Mary Wortley Montagu, the wife of the English ambassador to Turkey (1718-1721), observed this practice of inoculation.¹⁶ Not only was it more or less possible to regulate in this fashion the severity of the disease and to avoid many fatalities, but also to keep in check the very disfiguring scars (of special importance in Turkish harems). So impressed was the ambassador's wife that she practiced this form of inoculation on her children and brought news of it to England, where it came into great vogue until it was later replaced by Jenner's discovery of vaccination, the method of inoculation with cowpox. The Swiss physician Theodor Tronchin and the Tuscan Angelo Gatti were especially influential in popularizing the method on the European continent. Frederick II, of course, kept himself completely informed on this new prophylactic measure. In order to make Prussia safer from smallpox, he commissioned several English physicians to carry out inoculation in Berlin and to train Prussian doctors in this method. He was utterly enraged—in fact, it was said that he “hit the ceiling” (*“er ist an die Decke gesprungen”*)—when he heard that the French clergy objected to this prophylactic measure after they had been consulted by the Parliament in Paris. It was the famous encyclopedist d'Alembert who had kept Frederick the Great informed on these developments. In fact, the French opponents to inoculation might have been victorious in their conservative attitude had it not been for the intercession of the leading French intellects, including d'Alembert, Voltaire, La Condamine and the above-mentioned Dr. Tronchin, all of whom were vociferous defenders of the new practice of inoculation. Since these men were close friends of the Prussian king, it is scarcely to be wondered at that their point of view was eagerly adopted by Frederick the Great. The history of Frederick's friendship

with Voltaire is well known. Dr. Tronchin was physician-in-ordinary to the royal house in Versailles and enjoyed Frederick's absolute confidence. Tronchin was even called to the bedside of the ailing Prussian Prince Ferdinand. For d'Alembert King Frederick II had very important plans. He hoped to be able to persuade the French scholar to become the successor to Maupertuis and to take the presidency of the Prussian Academy of Sciences. And even though d'Alembert did not accept this appointment, he became in fact the unofficial president upon whose opinion King Frederick depended for all his scientific decisions.

By far the majority of the physicians in Berlin were opposed to the practice of inoculation. Indeed, in the political correspondence of Frederick the Great there is a letter from a physician in Berlin which reports that among the local physicians "there are not more than three who are in favor of it [inoculation]." In fact, even Frederick's personal physicians, including Dr. Selle, were "declared enemies" of this new practice.

While in Berlin and Paris the practice was slow in gaining proponents, there was much activity in London, where inoculation was performed widely. Since for that operation the skin was opened by means of the lancet, it fell to the surgeons to practice this operation. Frederick the Great became aware of the English medical activities through the reports of his ambassador in London. From this we gather that more than two centuries ago the diplomats were commissioned (like the scientific attachés of the American diplomatic service) to report on scientific and medical innovations.

In 1766 Berlin was visited by an especially severe smallpox epidemic which gravely affected several of Frederick's close relatives. The King requested his ambassador, the Count Maltzan, to make inquiries from the London surgeons who practiced this operation as to whether they might be able to send several of their disciples to Berlin in order to carry out inoculation and to instruct Berlin physicians in this practice. Although generous provisions had been made for the remuneration of the English specialists, the two men proved to be rapacious and made such extravagant demands that the King had them returned to England.

This unfortunate experience, however, did not discourage the King altogether from trying his luck with another English specialist. He began negotiations with Dr. William Baylies, who had settled in Dresden in order to introduce the practice in the Kingdom of Saxony and who was much admired for his tact and skill. Just when Dr. Baylies had responded to King Frederick's summons and arrived in Berlin, Frederick was informed that the Russian Empress Catherine the Great was about to have herself inoculated in order to try this new treatment on herself and also on her son, Paul, the successor to the throne. Frederick believed that inoculation was beneficial for children only, and potentially harmful to adults. He tried his utmost in letters to dissuade the Russian empress from the dangerous experiment. His efforts remained in vain. As for his own person, he absolutely declined to have himself inoculated without knowing that the attack of smallpox which he had suffered as a child would forever protect him from a recurrence of this disease. Even Dr. Baylies' international acclaim and the widespread use of inoculation in other countries did not allay the antagonism of the Berlin physicians. They used every conceivable ruse to get rid of Baylies and to prevent the introduction of inoculation. Nevertheless, Baylies' activities were so successful that he accepted the King's invitation to take permanent residence in Berlin. Thus Frederick the Great had succeeded in introducing the first all-important public health measure in the kingdom of Prussia.

Medical Treatment of Prostitutes

Other public-health measures of the King pertained to the control of vice and the possible limitation of the spread of venereal disease through prostitution. Specially suited women were employed to police the prostitutes. Anyone apprehended plying her trade was delivered by them to the abhorred *Spinnhaus* (Spinning House) in Spandau near Berlin, where she was given time to reflect on the evil of her ways while busy spinning wool for the Prussian cloth manufacture that had been thriving since its introduction by Frederick's father, King Frederick William I. Any who had venereal infection, however, were turned over to the famous Charité hospital in Berlin, which had been opened in 1710 by Frederick's grandfather, King Frederick I. Here they were subjected to mercury treatment and not released un-

til they appeared cured. In the archives are a number of discharge slips of cured prostitutes that testify to the prudence of this regulation.

Frederick's interest in the Charité and his feeling of responsibility for it had always been strongly marked. His usual well-known restraint in expenditures notwithstanding, he raised the royal appropriation for this institution to 40,000 *Thaler* annually and developed it into one of the foremost teaching hospitals and centers of medical education. The king himself, in the beginning, examined the credentials of the staff members and made the important faculty appointments in person. Although the hospital initially did not have university status, the leading positions in the Charité carried the title "Herr Professor." In making his selections for the teaching body, Frederick preferred former students of the famous Albrecht von Haller, and thus eventually all the important positions at the Charité were filled with men who had acquired their medical knowledge from Haller at the University of Göttingen. In this connection, it will be of interest to mention that the first experiments for the therapeutic use of oxygen, which had just then been discovered as an element, were made at the Charité upon the suggestion of Frederick the Great.

Considering the multitude of problems almost beyond imagination that descended upon the King at all hours, it is truly amazing that he was able to develop both an ardent interest and a well-founded knowledge of medical science and its ancillary disciplines. Anatomy especially he studied with the dedication of a first-year medical student, proclaiming that no one could possibly aspire to be a good physician and surgeon who was not thoroughly conversant with the anatomy of the human body. It is interesting that although he sponsored the anatomical department of the University of Berlin and concurred in the department's postulate of using human dissecting material, he made it unmistakably clear that under no condition was his own body ever to be used for anatomical studies.

Home-Grown Drugs Favored

Frederick read most of the contemporary medical journals, and whenever an article struck him as pertinent to his own health or that of his ailing brother and sister or any other patient about whom he was concerned, he would cut it out and

send it to the attending physician with the request that he treat his patients accordingly. He furthermore collected samples of various vegetable or mineral drugs that came into his possession and requested that they be analyzed by his physicians and that a determination be made of their value in certain diseases. A number of such royal missives to various doctors have been preserved, and it seems that they were not always taken by the recipient with unrestrained enthusiasm. The king's respected physician-in-ordinary, the Privy Councillor Cothenius, for instance, reported to His Majesty on one occasion that a Brunswigian balsam, sent to him with the request for analysis and evaluation for the treatment of pellagra, consisted only of volatile and bad smelling uric acid and some other sour and pitchlike component. He said that when in some cases he and other physicians had applied it to old and hardened gouty swellings, the balsam had some effect in the beginning of the treatment, but that was all. Frederick, in keeping with his mercantilist view in economic questions, always had domestic remedies given preference over foreign imports when they proved adequate. He forbade the taking of Vichy water from France instead of the waters from various Prussian spas because of the cost of transportation and customs duties on the former. He himself, throughout a long life of suffering, was content with the waters of Bad Pyrmont and other domestic spas which were reputed to be of help to sufferers from gout.

Besides the aspects of clinical medicine, Frederick also involved himself in the theory of the medical and natural sciences on an international platform. Foremost among the theoreticians with whom Frederick established close contact was Lazaro Spallanzani, a professor of biology at the universities of Modena and Pavia who had made fundamental experiments on fertilization and conception. His most important work was his attack on the theory of spontaneous generation in 1765, and he became famous for his researches on original creation and infusoria. Of equal importance were his studies on the regeneration of animal tissues and the circulation in embryos and cold-blooded animals. Spallanzani was greatly impressed by the interest of Prussia's intellectual king and let it be known that he wished to become a member of the Prussian Academy of Sciences, which had been founded in 1700 by Frederick the Great's grandfather, King Frederick I, with

the renowned philosopher and mathematician Leibniz as its first president. Spallanzani's membership was accepted with the full support of the king, and he was welcomed with a letter saying, "We are all charmed thus to acquire such a distinguished fellow-member."

After the deaths on the battlefield of his closest military friends, the generals Schwerin, Keith and Winterfeldt, the intimates in Frederick's entourage were mostly men of letters and sciences. Personages like Voltaire, with whom his friendship had begun when he was still crown prince; the French physician and scientist La Mettrie, who also became his reader; and finally Maupertuis, the permanent president of the Academy of Sciences in Berlin, were, together with his physicians, Cothenius and Selle, the king's ever-stronger connecting links with the physical and biological universe. It was these interests, some of which he happened to share with Goethe, that occupied Frederick's mind and completely pushed aside any thought he might have given the budding German romanticism of his period. He also remained totally indifferent to any aspect of German nationalism. And yet Frederick the Great became the hero of the very movements he had disregarded, and the personality and image of the great Prussian king became the idol of all Germany. He himself would have viewed it with strenuous reservations, to put it mildly, had he seen his likeness, as it was frequently shown during the Nazi regime, side-by-side with that of Hitler, who, in the final analysis, destroyed everything Frederick the Great had wanted to build.

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HIP DISLOCATION IN INFANTS

"If a pediatrician sends me an infant—one or two days old, a week old, or three weeks old—with the suggestion that he may have a dislocated hip and I find no evidence of that, I insist on following the child. I put him on double diapers and have him brought back every two or three weeks and examine him for a while until I'm sure, because you can't be certain and you can't categorically say that the child's hip is okay on the basis of one examination."

—THEODORE A. LYNN, M.D., Los Angeles
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